OPEN TEXT - BASED ASSESSMENT

ANNUAL EXAMINATION

2014-15

ENGLISH (101 & 184)

Class-IX

CENTRAL BOARD OF SECONDARY EDUCATION

Shiksha Kendra, 2, Community Centre,
Preet Vihar, Delhi-110 092 India

OPEN TEXT MATERIAL

1. Theme – *India's Tryst with Mars*

Abstract

Mars Orbiter Mission *will map the Martian geography, study the atmosphere and look for signs of methane gas, an indication of life on Mars. What is even more significant is that MOM proved the Government's 'Make in India' push, eminently practical: the $74-million Indian craft .The text discusses impact of space programmes on India's economy and society and the status of in India the field of space research. The text also suggests a future perspective, which will set students reflecting on their potential roles in the field.*

Mars. Mystic planet, the enigma of astrologers, the *anima mundi* of astronomers and the eternal obsession of science fiction writers, who terrified the world with stories of red-skinned Martians, armed with killer lasers arriving from the Red Planet to invade Planet Earth. But on the morning of Wednesday, September 24, 2014, India's Mars Orbiter Mission, affectionately nicknamed **MOM**, invaded the Red Planet by flawlessly entering its atmosphere and going into orbit. **Mangalyaan** was launched on November 5 last year and had travelled over 650-million kilometres to reach the Martian atmosphere.

From our very own *Aryabhata* satellite launched in 1975, in Russia, to our home-built *Mangalyaan* launched from Sriharikota, India's technological achievements have grown in leaps and bounds , and the Indian Nation has come a long way! **Mangalyaan,** formally known as the *Mars Orbiter Mission* or **MOM.**

These are two success stories, **Chandrayaan** and **Mangalyaan,** that have made India sit on the high table of technologically advanced nations.

Laudatory messages poured in, from all quarters, the press or on social net-working sites, for India's entry into the elite club of space-faring nations which have reached the Red Planet:

- *The Mars mission's success is continuity to the astronomical heritage laid down by astronomers like* ***Lagadha, Aryabhata, Brahmagupta*** *and* ***Bhaskara.****'*
- *Bharat scripted history by becoming the first country in the world to make it to Martian orbit in the very first attempt. A time when the whole world has its focus on Bharat, this great achievement marks another milestone in the path of glory*."

- *A milestone in the journey that we, as a nation, envisaged after independence*
- *The scientific and technological potential in India should be fully developed for use in other sectors.*

Three hundred days ago, India's space mission termed **Mangalyaan,** the voyage towards the planet Mars, was launched. It was what one calls a *"textbook"* launch with zero error, and one that has made India say *"Yes, we can".* And in 300 days, after a journey pampered with uncharacteristic attention, the Mars Orbiter Mission put itself into orbit around the red planet on schedule. That means, for the first time, a space agency has put a spacecraft around Mars on its first attempt (*NASA took two attempts to get so far; the Soviet Union, three*).Once that happened, it would start analysing the surface of the planet for any methane, a gas which is believed to hint at the presence of any Martian biology or life forms.

This point in the mission's long timeline, is a proud moment in the history of India, a nation that started its space programme just about 50 years ago or audacity of a young nation. With the **Mangalyaan** experiment, India has become a member of the technically advanced nations of the world.

The Space Commission Chairman, has also responded saying that every rupee spent here benefits people all across India. To put it in perspective, he said that **Mangalyaan** cost each of us over one billion Indians, about less than four rupees or four cents [*about the price of an onion or two*]! It is not just a grand bargain, but a steal!

What has the *"common citizen"* got out of these four rupees; or even forty or four hundred, counting over the year?

Plenty! You may have studied or read about how Indian satellites hovering around us give us real time information on weather, information to fishermen and coastal farmers on the tides and fish flock, on the state of ships and other vessels near and far from the coast, carry radio and TV waves, and most of all, help in saving lives of millions.

How does development occur? When and how does a country become *"developed*"?

Development has multiple components: proper food, clothing and shelter for the people; adequate education and culture; good health; good environment; equal opportunity for all; ability to defend from enemies; economic stability and growth; and above all, good governance, all leading to a feeling of justifiable national pride.

Thanks to the help from our space programme, the loss of lives in the recent cyclone Phanini was limited to forty-four and almost a million people were saved by prior evacuation. Earlier cyclones, when we did not have this facility of early warning, killed tens of thousands. Yes, but why to Mars? Herein is where the idea of development becomes important. India is still thought of as a "*developing nation*", once ridiculed as a "*ship to mouth"* economy.

Scientists Celebrate Mars Mission's Success

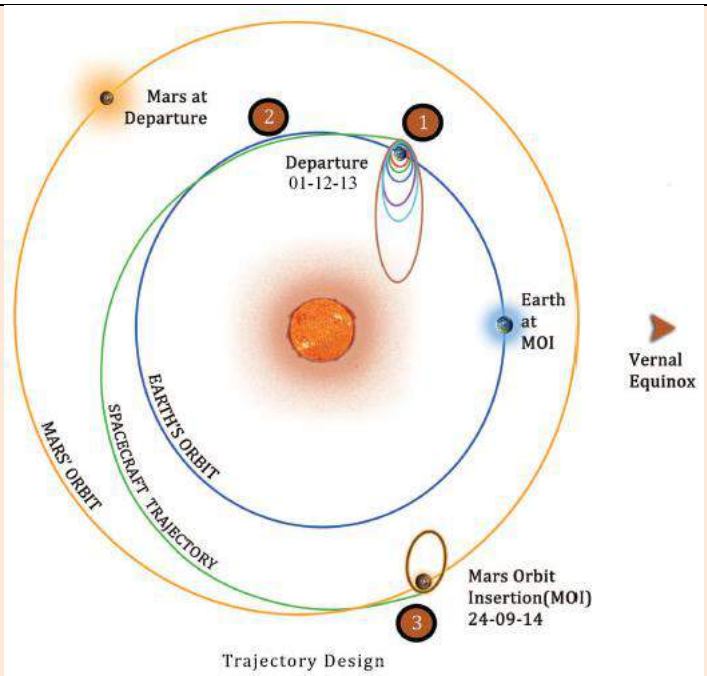
If you look at any one of these above components, technology plays a vital role in it. Technology comes out of logical, scientific and rational thought and its application. The greatest characteristic about technology is that it is scalable to millions, it becomes cheap and affordable, once it is spread, demanded and used; it can thus offer convenience and progress for the entire nation. Thanks to technology, we have now moved from *"ship to mouth"* to a "*silo to ship*" economy, and we rid ourselves of smallpox and polio, and are vaccinating all children against some common childhood diseases. It is here that **Mangalyaan** is relevant.

The expenditure of seventy -six million dollars has several other useful effects. We are using the latest technology, indeed creating new ones, and at a frugal cost. Mars missions by developed countries would be at least thrice costlier. This bespeaks its original purpose being a demonstration of the perseverance of ISRO personnel, especially considering everything else about the mission was a cobbling together of well-tested components. That **MOM** had a scientific payload on board seems incidental even if its observations will soon be the centre of much attention. And the design, building, testing and setting up have all been done by Indian engineers. Only some vital components were imported. It has thus led us to be self-sufficient and advanced our capabilities.

The technological prowess to aim for Mars means that we can apply it even better for terrestrial needs at home. It also brings us business, you may already be aware or have read about Indian satellites already carrying the payloads of other countries.

This can also be good news for Indian cosmologists and astrophysicists who, like many other scientists in India, have been clamouring for a hike in research and development funding since the early 1990s.

THE MISSION: The Launch Vehicle - PSLV-C25 injects the Spacecraft into an Elliptical Parking Orbit with a perigee of 250 km and an apogee of 23,500 km. With six Liquid Engine firing, the spacecraft is gradually maneuvered into a hyperbolic trajectory with which it escapes from the Earth's Sphere of Influence (SOI) and arrives at the Mars Sphere of Influence. When spacecraft reaches nearest point of Mars (Peri-apsis), it is manoeuvred into an elliptical orbit around Mars by firing the Liquid Engine. The spacecraft then moves around the Mars in an orbit with Peri-apsis of 366 km and Apo-apsis of about 80000 km.

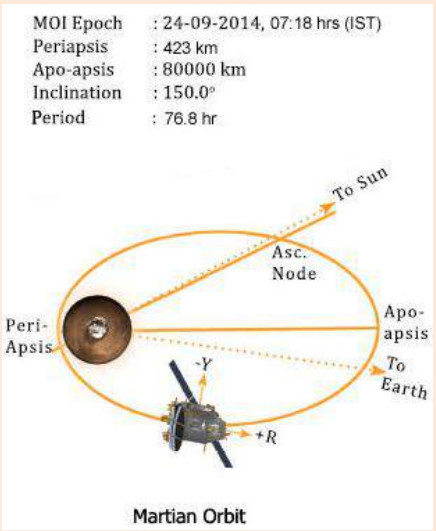


Trajectory Design

The mission consists of following three phases:

1. Geo Centric Phase

The spacecraft is injected into an Elliptic Parking Orbit by the launcher. With six main engine burns, the spacecraft is gradually maneuvered into a departure hyperbolic trajectory with which it escapes from the Earth's Sphere of Influence (SOI) with Earth's orbital velocity + V boost. The SOI of earth ends at 918347 km from the surface of the earth beyond which the perturbing force on the orbiter is mainly due to the Sun. One primary concern is how to get the spacecraft to Mars, on the least amount of fuel. ISRO uses a method of travel called a Hohmann Transfer Orbit – or a Minimum Energy Transfer Orbit – to send a spacecraft from Earth to Mars with the least amount of fuel possible.



Martian Orbit

2. Helio Centric Phase

The spacecraft leaves Earth in a direction tangential to Earth's orbit and encounters Mars tangentially to its orbit. The flight path is roughly one half of an ellipse around sun. Eventually it will intersect the orbit of Mars at the exact moment when Mars is there too. This trajectory becomes possible with certain allowances when the relative position of Earth, Mars and Sun form an angle of approximately 44°. Such an arrangement recur periodically at intervals of about 780 days. Minimum energy opportunities for Earth-Mars occur in November 2013, January 2016, May2018 etc.

3. Martian Phase

The spacecraft arrives at the Mars Sphere of Influence (around 573473 km from the surface of Mars) in a hyperbolic trajectory. At the time the spacecraft reaches the closest approach to Mars (Periapsis), it is captured into planned orbit around mars by imparting ΔV retro which is called the Mars Orbit Insertion (MOI) manoeuvre. The Earth-Mars trajectory is shown in the above figure. ISRO plans to launch the Mars Orbiter Mission during the November 2013 window utilizing minimum energy transfer opportunity.

What the press says…

Calling India's first space mission to Mars *"historic,"* an enthusiastic *Times of India* update report, earlier this month, began, *"Hurtling towards the Red Planet . . . the Mars Orbiter Mission will not have time to pause and celebrate"* its first 100 days of spaceflight. Moreover, there'll be *"no applause from its only true spectators—the mute planets and distant stars."*Building things creatively and inexpensively has today become a national strength. India built the world's cheapest car and even innovative creations like flour mills powered by scooters. India's space budget, the article reports, is 5.5% of NASA's. India launches non-Indian Earth satellites cheaply for others. And India's spaceflight engineering labour costs are low. The *Hindustan Times*, which calls **Mangalyaan** "*a budget player in the global space race,"* emphasizes that only 21 of 51 attempted Mars probes have succeeded, with only the US, Europe, and Russia having orbited or landed probes there. The applauding *New York Times* article, *"From India, proof that a trip to Mars doesn't have to break the bank,"* examines the *"budget player"* dimension.

The future…

MOM's success has helped India to assert herself as a regional space-power that not only markets herself as a low-cost hub, but also as a country that can set the agenda for regional cooperation.

Hopefully, the programme will gain strength in the next decade, the payload will be increased, the scientific agenda will be modified along with the infrastructure on the ground. Going ahead in the years to come will keep **MOM's** achievement as an important milestone of Indian scientific-technological progress.

There is yet another perspective that needs to be examined — the promotion of science and technology through the processes of engaging and enticing students at the school and college levels, and their parents, and explaining to them the available career options. Recall that ISRO and the Space Commission have started doing this by broadcasting the inserting of the spacecraft into the orbit of Mars using Edusat TV. This is also an appropriate moment for us to organise regular sessions in our schools across the country. The *jargon* used in the sessions could be simplified, presented in all the twenty two scheduled languages, and English, explaining how scientific laws were applied to all aspects of space launch.

MOM has shown us *"Yes, we can*". The event still holds our fascination, and the time is just right. *"After all, every 'mom' teaches her children and cares for their future, assisting them in every way. So why should ISRO's MOM not do so for all children across India?"* the *voxpopuli* ask.

These days, the achievement has captured the imagination of youths - as shown by the over 2 lakh "likes" by 18-21 year-olds, on the **MOM' s** account in the social networking site. **Mangalyaan** thus is a tool to attract youth and advance science. It is, therefore, not just an expense, but also an investment for the future. Today it is Mars, tomorrow even greater challenges. Should India not be ready? Mars is, thus, a metaphor.

Sample Questions:

Read the questions carefully and answer to the point in about 100 to 120 words. [2x5=10]

1. India has become the 4th nation in the world and the first in Asia to embark on a successful mission to Mars. While the Indian media and leaders have gushed at this achievement as a national pride, how would it benefit the common people? Answer with suitable observations and illustrative examples.

KEY:

- India's satellite technology strengthened existing telegraphy, telephony, wireless telegraphy and also radio communication.
- Bio-prospecting becoming easier, with satellites helping Indian scientists reap nature's benefits
- map vegetation, ecological zones and landscapes to provide valuable information for use in hunt for new resources – e.g., plants as potential sources of undiscovered drugs; map India's zones of biological diversity
- this mission makes India a contender for the commercial global space market estimated at $300 billion
- commercial gains through use of technology
- MOST IMPORTANT: developing a spirit of inquiry and exploration in young minds

2. Imagine, that you are a student-astronaut, who had participated in the launch. Describe what you experienced while in flight and later and, what you felt and saw when Mangalyaan entered the Mars orbit.

KEY:

- the solid rocket motors ignite and this feels like a huge kick behind, the vehicle shakes a lot and the ride is rough for the first two minutes as you are pressed back into your seats with twice your weight. When the solid rocket motors burn out there is a big flash of light as they separate from the big fuel tank the shuttle is strapped to. Then the ride smoothes out. As the space-vehicle gets higher into the thinning atmosphere and burns off most of the fuel, the vehicle accelerates faster and you are pressed back into your seat the last few minutes of the ride.
- Once the main engines stop , immediately you go from the being squashed to being weightless
- Weightlessness due to lack of acceleration,
- From far away from the Earth, and later in the Mars Orbit, you are in a good position to study the Mars & the stars,
- make records –writing and drawing, working in the absence of gravity
- describe features of Mars that are visible from the orbiter-red soil, craters, space storms, length of the Mars day,
- How Mangalyaan manages to capture only the 'bright side' of the planet.
- A sense of wonder, curiosity and pride in India's achievement

OPEN TEXT MATERIAL

2. Theme – The *Cleaning up Campaign Sweeps across the Country*

Abstract:

Public spaces in India's cities often are eyesores full of rotting piles of trash along the streets, in neighbourhoods, public parks and playgrounds, and outside fancy air-conditioned malls and five-star hotels. On Gandhi Jayanti, this year, Prime Minister Shri Narendra Modi launched the Clean India [Swacch Bharat Abhiyan] campaign that aims to clean all places of human habitation in India of filth and litter. In his words: "We have to give Mahatma Gandhi something on his 150th birth anniversary, in 2019. Just like the whole nation united to fight for freedom back then, we have to work together to clean India now."

The text attempts to familiarise students about the status of hygiene practices in India in the past, the role played by individuals like Mahatma Gandhi and the potential role of youth to raise public consciousness about good sanitation. The issues are presented in the form of prose, poetry and drama, which would motivate students greater to read, assimilate and analyse the challenges with interest.

The following skit [*slightly adapted*] by Vaishnavi Rajesh, revolves around three youngsters – a youngster from city, a youngster from the town and a doctor who is from city but practiced medicine in town. The three people realize the need and importance of proper disposal of industrial waste and the health hazards when it is not done. They start a mass movement and the country is cleaned successfully.

Characters:

Pargat - A youngster from a town

Arjun - A youngster from a city

Dr. Veni - A doctor

Some common people, porters

Scene - I

(At the railway station of a city called Pragatipur. At the centre of the stage is Arjun standing under a board which reads 'Platform No. 2'. Arjun is a 18-year old boy who is the son of a rich leather factory owner. He waits for his friend Pargat, who is from a town called Swarnapur. The railway station is busy and noisy with people and porters. Pargat, who is also 18 and has just started going to college, enters from left, pulling a trolley bag. They greet each other).

Arjun: Hello, Pargat! How are you? It has been a long time since we met. Glad to meet you.

Pargat: Yes! I'm fine brother. I'm really happy to see you. It has been 7 years since we had met last. You've really grown tall! Anyway, I'll be staying here for 6 months at a stretch.

Arjun: *(laughs)* You too! Come, let's keep moving. We have to go home and then we'll pay a visit to my uncle's factory. I'll show you some really interesting things happening over there!

Pargat: Okay! Let's go. *(The two exit towards the right)*

Scene - II

(They reach Arjun's house which is well lit. A sofa in the centre. A window with a flower vase on its sill. A tea-table in front of the sofa with some newspapers. To the left is a closed shelf. They enter from the left. Arjun takes Pargat's trolley and puts it inside the shelf).

Pargat: Okay, Arjun! I'll get ready in a few minutes and we'll meet again then…

Arjun: Alright! Take your time. I'll wait here for you.

(Arjun sits on the sofa reading a newspaper. Pargat exits through the left. He comes back after sometime. His hair is neatly combed).

Pargat: Let's go, brother!

Arjun: Oh! You're here! Let's go! The factory is nearby. So let's walk down.

Scene - III

(Pargat nods his head and they exit through the left. They carry a bottle of water and some fruits with them. They reach the factory and Arjun takes Pargat to a place from where a river can be seen. The backdrop of a stage is a river with the industry releasing its waste into the water at right. Black smoke rises from the chimney to the right).

Pargat: Oh! It stinks here! How do the factory people work here every day, Arjun? The water standing beside the factory is greenish-brown and slimy. And the hot, black smoke rising from there makes me feel very uncomfortable. We don't have such things in our town. Aren't you getting any smell, or even feel the heat?

Arjun: That's alright Pargat. Never mind them. Where else can we dump our waste? Tell me? Don't worry, they won't harm anyone.

Pargat: But the fish in the river may die. They need clean water. And what if the farmers are using this water for the crops?

Arjun: Come on, Pargat! Don't be so silly. Do you want us to store the effluents in our house? Come, let's go inside the factory. Here, have some water and a fruit.

Scene - IV

(They go inside and have some fruit and water. They return home after a while. The next day morning, Pargat complains of vomiting, stomach pain, diarrhoea and cough. Arjun and Pargat go to the doctor. Dr Veni is a 35 year-old woman. The clinic has a table with the doctor's usual instruments. A stool to the right of the table and two chairs to its left. Arjun and Pargat enter through the left. Pargat sits on the stool while Arjun sits on the chair. Pargat tells her out his problems and adds that that he is from a nearby town, and has come to the city the previous day. Dr. Veni writes him a prescription)

Dr. Veni: There's nothing to worry, Mr. Pargat. I too had faced the same problem once. I completed my MS here, and when I went to Swarnapur for my internship practice, I found the town very clean and peaceful. I got used to the water, food and weather there. When I returned here, I too had suffered the same health problems. You know, Mr. Arjun; our city is so dirty when compared to their town. Unless and until we, as citizens, take steps to clean it, we too may face the same situation, sooner or later.

Arjun: I understand, doctor. My father is a leather factory owner and we too dump the factory waste in the river and pollute the air. Our life span is decreasing. My grandfather used to tell us that the life expectancy in his clean town was about 80 years. But, people are falling ill nowadays by 30 years itself.

Dr. Veni: I suggest that you treat your factory wastes, thereby rendering them harmless before releasing them into the environment. Thousands of people from various categories pass away every year due to air-borne, water borne and vector-borne diseases. The dirty water becomes a breeding ground for mosquitoes and other insects. The river water, when used for irrigation, poisons the crops. This results in diseases like cholera, diarrhea, typhoid, malaria, dengue, asthma problems, tuberculosis and several other fatal diseases…. *(pause).*

I have a suggestion for both of you. Why can't we start a movement from our locality itself? Isn't it a good idea? What do you say, Mr. Pargat?

Pargat: Sure, doctor! Let us make our city and nation a heaven!

Dr Veni: Good! Any plans for our movement?

Pargat: First, we must educate people about the need and importance of industrial waste management and tell them the health hazards of not having a clean environment. Using the media will trigger people's participation. Then, we'll raise some funds, and then, make it a mass movement.

Arjun: Everything is fine, Pargat, but using the media will cost a lot! Publishing an ad on TV, or radio or newspaper, everything needs to be paid for. We don't have any money right now.

Dr. Veni: Why do you need money, Mr. Arjun? We have the internet, which is free! Why don't we post a picture of us three cleaning the city and explain the problem, consequence and the solution to some of these problems. Each of us can post this in our own Facebook or Twitter or any other social networking site accounts and make the 'post' open to all. I am sure that some of our friends will get motivated and start joining our movement. We can even raise awareness about this among our friends and relatives. We can e-mail regarding these issues to a wider circle of people who can access and use the computer and internet. They too will raise their own movement in their localities.

Arjun & Pargat: A brilliant idea, doctor! It's a wonderful idea!

Arjun: Good! We can go to some schools and organize a few workshops when we are free. Students have to be targeted the most because they make up tomorrow's nation. I will get some posters made and hand them over to the factory workers and other local public. I will also motivate the workers and ask them to spread this idea to all of their family members. I will ensure that my uncle installs a waste-treatment system in the factory. Remember, no sticking posters here and there; they may make the place dirty.

Pargat: I will write some articles regarding this to be published in the newspaper. It is priceless.

Dr. Veni: I will definitely write about this and get it published in a medical magazine. I will also put up an article written in my clinic's notice board. We must request people politely to donate for this environment-friendly movement and raise funds.

Pargat: After we collect some money, we must share it and recharge our mobiles. We can send SMSs to people, even some random numbers. I have an idea. We can even speak to the MLA who lives in our locality – Mr. Sudhir Singh. He is very friendly and is known for taking practical steps to fulfill the needs of the people. Let us draw his attention to this. I am sure he will help us.

Arjun: This is a wonderful idea, buddy! We can represent our city and speak with Mr. Sudhir Singh tomorrow at around 11 a.m. Are you free tomorrow, doctor?

Dr. Veni: Since it is beneficial to all the people, I will open my clinic tomorrow only in the evening, by 4'o clock. We'll go tomorrow. Let's meet here at my clinic at 10.15.a.m.

Pargat: Remember, we need to focus on the importance of the proper disposal of industrial waste and the health hazards caused due to its improper disposal.

Arjun: You're right, Pargat. Fine, doctor. Thank you very much. We'll meet tomorrow here. Let us take leave, and here's your consultation fee.

Dr. Veni: Thank you! All the best and wishing you a speedy recovery, Mr. Pargat! Take your medicines properly today so that you can come back healthy tomorrow!

(The trio meets the MLA Mr. Sudhir Singh and speaks to him regarding the issue. They request him to speak about this to the Mayor and represent their requests in the Legislative Assembly. Mr. Sudhir Singh raises the topic in the Legislative Assembly and the trio to do their best in their said works to create awareness among the people and successfully gather people to join the movement. A few months later, at Arjun's house….)

Pargat: Buddy! Did you read today's newspaper and watch the television this morning?

Arjun: No. Anything interesting?

Pargat: Yes, dear friend! The same thing is broadcast on the television and radio. Listen… *(clearing the throat) "Mr. Arjun, Mr.Pargat and Dr.Veni speak to MLA Mr. Sudhir Singh about the harmful effects of releasing untreated industrial waste. Mr. Sudhir Singh speaks in the Legislative Assembly and*

new laws are formed. Firstly, students who participate in their movement for cleaning their neighbourhood and their environment ,will be awarded 10 marks extra in their final exams. Secondly, workers who join the movement with be provided 10% bonus in their salary for 5 months. Thirdly, senior citizens in the movement will be given discounts in ration shops. Fourthly, people and industries found to pollute the environment will be heavily fined from Rs. 1000 to Rs 10,00,000. People all around the state started joining the movement. So, will you join the movement? Let us join hands and say, 'CLEAN INDIA, HAPPY INDIA'."

Arjun: Hurray! We've done it, Pargat! We are really making a way for a 'CLEAN INDIA, HAPPY INDIA'

Going back in time…

The relation of modern engineering to ancient engineering is difficult to comprehend considering that modern engineering is so highly specialized and technologically advanced. Design and rules-of-thumb, empirical equations, physics, numerical methods, computer simulators, and other-engineering tools taken for granted today were not available to ancient engineers. Despite the supreme technological advantage today's engineer has over the ancient engineer, fantastic engineering feats rivalling those of today were achieved throughout history. For example, the Indus Valley civilization of northwestern India flourished from 2600-1900 BCE. Harappa, Lothal, and Mohenjo-daro are three of the extensive archeological excavations in the region, a UNESCO World Heritage Site. They are noted for sophisticated public works that included sewage drainage systems, public wells, and private and public baths.Mohenjo-Daro's *"chief glory*" was a complex system of drains that ran throughout the city. According to one scholar, *"only the Romans, more than two thousand years later, had a comparable drainage system."*

Mohenjo-Daro had a flush system in almost every house.

A nearby well provided the water and could be emptied through a drain.

Mohenjo-daro city was situated on a slope between two streams. At the point where one of the streams meet the city's walls, people carved a large reservoir out of rock. This was connected to a network of small and big reservoirs that distributed water to the entire city all year round. When you have such an extensive domestic water storage system, the next problem that arises is that of drainage. Town planners of Mohenjo-daro had built the worlds first known main drainage system. It was a central system that connected every household in the city. Almost every house had a drinking water well, with a private bathroom. Earthenware waste pipes carried sewage from each home into covered channels that ran along the centres of the city's main streets into the nearby agricultural fields, rivers, or streams. The drains took waste from kitchens, bathrooms, and indoor toilets. The main drains even had movable stone slabs as inspection points. The houses had excellent plumbing facilities for provision of water.

Following the fall of the Roman Empire, cities in most of Europe and parts of Asia, began to shrink considerably as residents migrated away from the urban centers (*Bishop 1968*). The population reduction of the cities resulted in the abandonment of municipal services, e.g., sewer systems, runningwater. The neglect of these systems contributed to their deterioration. Another factor that contributed to the demise of urban drainage systems during this time period was the general apathy and indifference of urban residents during the time period. If people neglected their own cleanliness how could they be expected to be concerned with the cleanliness of the community?

Down the years…

As Indians, we take pride in our cultural advancement by pointing to the Great Bath at Mohenjo-Daro as evidence. While our people were bathing and had evolved a sophisticated sanitation system in our earliest cities, a large number of the world's population were (and are) still to discover the rudiments of personal hygiene.

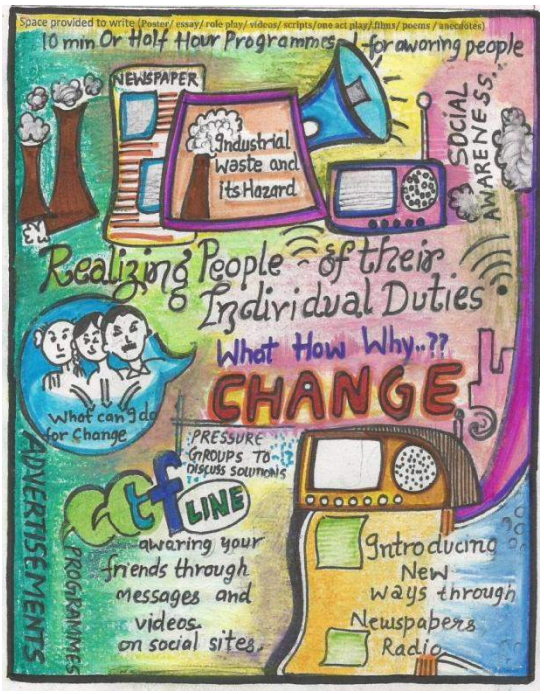
The country's ten billion dollar **Clean India** campaign aims to install more toilets, to end open defecation, improve trash disposal and educate citizens about the link between sanitation and public health. The launch was timed to coincide with the birthday of Mahatma Gandhi. In fact, Mahatma Gandhi included this issue of sanitation in his constructive programme, which he formulated and made it the central strategy for attaining independence for the country. His famous observation, *"If we do not keep our backyards clean our 'swaraj' will have a foul stench"* remains so intensely and poignantly relevant at that time as it is today...Mahatma Gandhi wrote extensively in the *Indian Opinion*, *The Amrit Bazaar Patrika* and several other newspapers about the methods to prevent epidemic diseases. It is instructive to learn that Mahatma Gandhi, in his articles, essays and letters, blamed our unclean habits and unhygienic conditions for the emergence of diseases. He even appealed to the educated Indians to become missionaries in hygiene and sanitation.

Microsoft founder, Bill Gates, has praised the Government's focus on providing toilets as a critical driver of children's health. The dynamism of the **Clean India Campaign** could make the mammoth task a reality. Reaching out to each government and private school in every village and town looks

daunting, but the spirited movement will, eventually, touch the chord of each child who would soon be given the privilege of using a toilet.

The challenges ahead…

In its simplest connotation, the term 'environment' means the surrounding habitat of human beings. In its narrowest meaning, 'environment' means the immediate surroundings of a person – his/her home, work place, market, neighbourhood, etc. It also includes the atmosphere in which a person lives. In its widest sense, it refers to the entire earth with its green forests, vast oceans, the layers of air and oxygen, etc. The importance of good and clean environment cannot be described adequately. The main factor which influences the growth of individuals is their environment. But unfortunately, the various elements of environment such as, air, water, land, etc., are polluted and contaminated.



Urbanisation, industrialisation and over-crowded living have primarily been responsible for this menace. India's rise as an economic powerhouse depends on the thousands of small and large scale industrial units which simply dump their waste, more often toxic and hazardous ,on land or discharged into water bodies, without adequate treatment causing environmental pollution and health hazards, despite the requirements of the pollution control measures. Management of industrial waste flows in a cycle: monitoring, collection, transportation, processing, disposal or recycle. People and companies need to educate themselves about the environment. Haze and smog alerts in urban areas usually result from harmful transportation emissions, and output of factories into the air that we breathe.

Nearer home, our Prime Minister said, *"'I will not litter, I will not allow others to litter', is what we must resolve if we are true children of this motherland"*. As we clean our homes every day, why can't this attitude not be extended to overall cleanliness and *Swacch Bharat*? The Prime Minister has called for a change in governance and attitude towards hygiene and sanitation. The pursuit of cleanliness could be an economic activity, contributing to GDP growth, a reduction in healthcare costs, and a source of employment.

Willing Hands Make Any Work Meaningful

In the 21st century, the country is at a turning point. Time is running out faster than ever, and any further delay in implementation of sanitation and environmental programmes will cause irreparable damage to both nature and human beings. No army or professionals, howsoever big, and even well paid, can clean up the squalor left behind by 1.3 billion people... Each one of those 1.3 billion has to act responsibly and not litter and take care of their own garbage. The individuals, households, schools are the places where this fight has to begin and be won!

[Any Two]

Read the following questions and answer them concisely in about 100 to 120 words each.

1. On a recent visit to a nearby settlement [*in the picture] during a neighbourhood cleaning campaign,* you were appalled by the living conditions of the people and the prevalence of communicable diseases like typhoid, malaria and jaundice, with a high infant mortality rate. Write a letter to the Ward Councillor of your locality, expressing your views, and offering suggestions for improving the living conditions of the residents. (5)

Qn. 01: KEY: Causes & consequences: lack of information, lack of proper maintenance sewage & sewerage systems by local bodies, spread of diseases, infant deaths, breeding of flies and mosquitoes etc.

Solutions: Speaking to the people about vaccination, against open air defecation and the need to use toilets, personal hygiene, meet the ward councillor with a plan to build public toilets , a school, distribution of suitable books or showing them videos about health ,hygiene & environmental conservation, some inhabitants to address students , promote literacy, design posters, placards.

2. The concept of Sulabh International, a project that converts night soil to bio-gas, visited your school and gave a talk about the need for construction of such toilets in homes, in villages. Write an article to be delivered during the Eco-club Meeting, on the problem, highlighting how the lack of sanitation puts the health of the people at risk. (5)

Qn. 02: KEY: About: Works to promote human rights, environmental sanitation, non-conventional sources of energy, waste management and social reforms through education. Innovations: A scavenging-free two-pit pour-flush toilet - *Sulabh Shauchalaya* Safe and hygienic on-site human waste disposal technology.

Promoting literacy among scavengers, so that they can compete in open job market Maintenance and construction of pay-&-use public toilets Bath, laundry and urinal facilities being used by about ten million people every day and generates bio-gas and bio-fertilizer produced from excreta-based plants, low maintenance, waste water treatment plants of medium capacity -for institutions and industries

3. In 2013, more Indians have access to mobile phones than adequate sanitation facilities. But habits like littering and spitting in the streets are also perennial problems with serious health consequences .Will people in our cities and towns stop littering the roads and spitting in public places as a result of the Clean India Campaign? Express your views on the topic in a letter to the editor of a leading daily. (5)

Qn. 03: KEY: Solutions: Legislation to control the use of plastic, steel and other non-biodegradable products have had tremendous impact on the country's environmental degradation and litter problem.

Ban the use of plastic bags for commercial purposes

Impose fines for spitting & littering [on-the-spot]

Public awareness through the media-they hinder quality of life & the environment & the global image of Indian society as a whole.

4. Plan a 'My Clean Home, Clean School, Clean India' campaign in which students of classes IX to XII can contribute to raising awareness among your school mates, parents and community. Put down your ideas in the form of a short essay. (5)

Qn. 04: KEY: The activities of the campaign: To be coordinated by the teachers and the head boy and head girl of the school.

Appealing handmade posters, articles, and pamphlets– for display & ralley Songs, dances & skits to convey the right message and and to give an air of festivity Involve nearby schools and eco-friendly factories.

Include face to face interaction to awaken the public, industrialists and the government to take quick steps.

Stress on waste management and its treatment before disposal. Look to save our monuments & natural resouces